FORESTRY leaflets
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"NATURAL vs. ARTIFICIAL REGENERATION FOR LONGLEAF PINE"

HOW DO LONGLEAF SEEDLINGS GET HERE?

Nature has been establishing longleaf pine for eons. Seed falling onto fire-exposed mineral soil readily germinates when moisture is adequate. Unlike most other pines whose seed lies dormant through the winter, longleaf pine seed will germinate in the fall within two weeks after falling from the cone. This is a natural tactic to avoid the intense predation from squirrels, birds, and other wildlife. Young seedlings grow rapidly in diameter and in root mass, but they do not grow in height for 2 - 8 years, depending upon competition and genetics. This period of little or no height growth is called the "grass stage". A longleaf pine in the "grass stage" is very resistant to fire. When height growth commences, the longleaf pine can grow two to four feet in one year. This is a natural adaptation that allows the tree to quickly get it's buds above the normal flame lengths. Within a couple of years, the young longleaf saplings are once again very fire resistant.

Establishing longleaf pine today can be done through natural means such as "seed-in-place" or "shelterwood", or longleaf pine can be established artificially through the planting of commercially produced seedlings. The method that is best on any given piece of land will depend upon the existing features of the site and upon the goals of the landowner.

Natural regeneration is usually done through one of two methods: "seed-in-place" or "shelterwood".

Seed-in-place is accomplished by delaying any timber harvest of an existing longleaf stand until a good or excellent cone crop is observed. A fire is run through the understory prior to harvest to reduce pine litter and produce a good seedbed of bare mineral soil. The harvest cut must be timed just prior to, or during, seed fall in the autumn. The logging activity further scarifies the soil and shakes the seed out of the cones. The seed germinates shortly after logging.

Shelterwood harvests have a little more room for error. Prior to harvest of an existing longleaf pine stand, 20 - 35 top quality pines per acre (12 - 20 inches diameter - 14+ inches are best) are selected and marked. All trees are then harvested except for the marked seed trees. A site preparation burn is conducted in the late summer to reduce litter and prepare a seedbed. Longleaf seed will fall in October (some in early November). By spring, a seedling count is conducted to see if adequate stocking is present. If there are insufficient seedlings, then another burn is conducted the following summer to prepare the seedbed for the next cone crop. When adequate stocking is achieved, a final harvest can be planned to remove the seed trees. The regeneration should be 1-2 years old when the seed trees are cut. Up to 50% of the seedlings can be destroyed by the seed tree harvest, so stocking must be about double the needed number of trees before the loggers move on the site.

Artificial Regeneration involves a good, clean clearcut followed by adequate site preparation and

planting. Generally a summer harvest is favored to minimize the number of natural seedlings that develop (esp. loblolly). In the summer after harvest some type of site preparation is done to control competition from undesirable species, reduce litter depth, and reduce logging slash. Herbicides, combined with mechanical site preparation or combined with fire, are favored. Planting is done in the late autumn or winter. Containerized longleaf pine seedlings tend to have much better survival than bare-root seedlings and are favored for planting on cutover sites.

NATURAL REGENERATION

Advantages:

- can be less expensive
- seed source still present in the event of high seedling mortality (shelterwood only)
- "shelterwood" leaves an attractive overstory until regeneration is established

Disadvantages:

- requires a natural seed source - not available everywhere
- no control of seedling spacing
- no control of seedling stocking
- may have to wait 3-5 years for the longleaf seed trees to have a good cone crop
- seed trees could be damaged from the site preparation burns, harvest operation, or lightning strike, causing a loss of timber value
- may not be able to get the seed trees harvested at the proper time
- seed tree harvest could destroy too many seedlings

ARTIFICIAL REGENERATION

Advantages:

- does not require a longleaf pine seed source
- containerized seedlings have a very good survival rate
- genetically improved trees have the following advantages:
  - ⇒ grow faster
  - ⇒ better formed
- come out of "grass stage" sooner
- controlled spacing
- site preparation can be more intensive since there is no need to protect the seed trees

Disadvantages:

- can be more expensive
- requires that site be very clean to allow accurate planting at the correct depth
- can make the site look "agricultural" for a couple years after planting

Any type of longleaf pine reforestation should be done under the direction of a qualified forestry professional. For more information contact your local County Ranger.

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